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FIG. 3

GB 2 334675 A

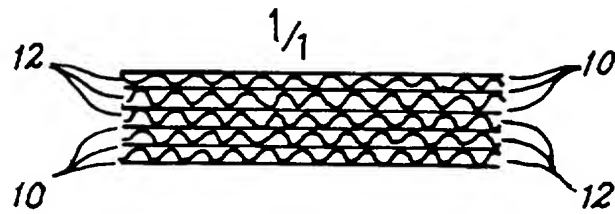


FIG. 1

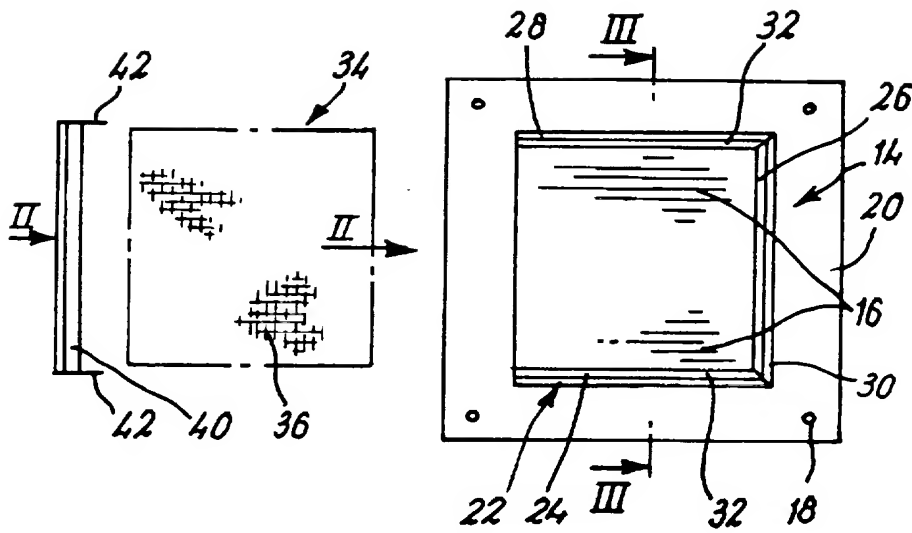


FIG. 2

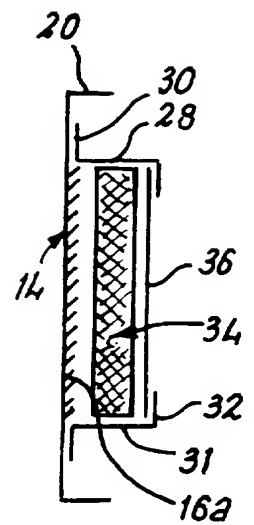


FIG. 3

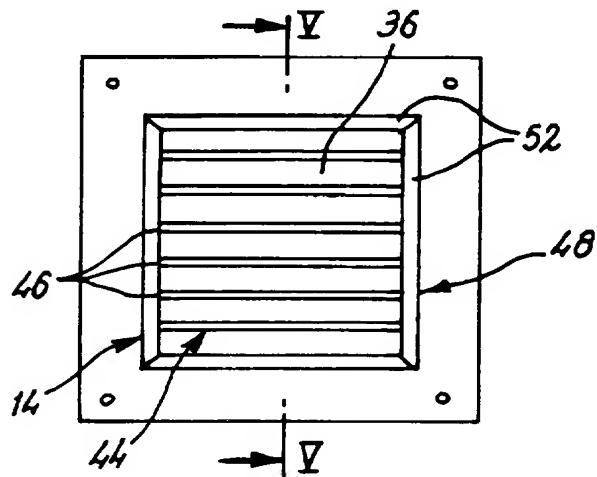


FIG. 4

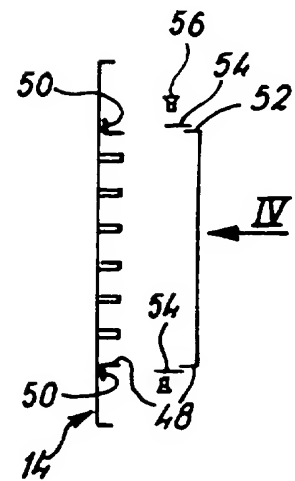


FIG. 5

Improved Intumescent Ventilator

The present invention concerns improvements in or relating to intumescent ventilators.

Intumescent ventilators are currently used in walls, doors etc where it is important that the barrier to fire passing from one area to another provided by the wall or door is not appreciably impaired by provision of a ventilator which, in normal conditions, permits the passage of air from one area to the other.

Present intumescent ventilators incorporate a layer of material which normally allows air to pass through it but, on being heated, expands to provide a fire proof barrier.

Difficulties are encountered with present intumescent ventilators particularly when they have to be installed in cavity doors or walls, that is hollow doors or stud and plasterboard walls. In such locations it is necessary to construct a framework within the cavity in which a structure carrying intumescent material can be mounted, this often resulting in an "oversized" hole, and thereafter covering the hole on both sides of the wall or door with a grille.

According to the present invention there is provided an intumescent ventilator including a grille adapted for mounting on an outer face of the structure in which the ventilator is to be mounted, the grille carrying on its face facing the structure mounting means for an intumescent member which normally allows the passage of air therethrough.

Preferably the intumescent member comprises a honeycomb of an intumescent material. Alternatively the intumescent structure comprises a plurality of strips of intumescent material arranged in spaced relationship, the spacing being such that on being heated in a fire, the strips expand to close the spacing therebetween.

Preferably the mounting means on its side remote from the grill is provided with a metal mesh.

Preferably the intumescent member is rectangular. It may have a thickness of around 20mm, alternatively it may have a thickness of around 40mm.

Preferably the mounting means includes three first members fixed to the, in use, inner face of the grille, each member being provided at its outer edge with a flange directed towards a facing member such that the flanges and rear face of the grille defines a channel for reception of the intumescent member, and a fourth member for closing off the open side of the rectangle formed by the first members after the intumescent member has been slid into the rectangular space.

In an alternative arrangement the mounting means includes two pairs of first members each having an L-shaped cross section and each being fixed to the inner face of the grill to define a rectangular space which accommodates the intumescent member and two pairs of second members each of the L-shaped cross section and fixed together to form a rectangle, the second and/or first members having co-operating fixing means such that the second members can be fixed to the first members to enclose the intumescent member at its edges.

An embodiment of the present invention will now be described by way of example only with reference to the accompanying drawings in which:-

Fig. 1 shows diagrammatically part of an intumescent member;

Fig. 2 shows an elevation from the rear of an intumescent ventilator;

Fig. 3 shows a cross-section through the ventilator of Fig. 2 in the direction of arrows III to III;

Fig. 4 shows a rear elevation of another embodiment of an intumescent ventilator; and

Fig. 5 shows a cross-section through the ventilator of Fig. 4 in the direction of arrows V to V. The vanes are omitted for clarity.

An intumescent member comprises a honeycomb of an intumescent material comprising parallel layers 10 of material and corrugated layers 12 extended between and fixed to the parallel layers 10. This is a standard product and is supplied in various thicknesses, for example 19 and 38 mm. This member allows air to pass therethrough and consequently is of use in ventilators. When a fire occurs, the heat generated by the fire causes the material to expand to fill the gaps between neighbouring pieces of material thereby providing an impenetrable fire barrier.

Fig. 2 shows an intumescent ventilator which comprises a pressed metal grille 14, which may be of standard configuration and comprises a rectangle having slots 16 cut and pressed therein to provide inwardly directed vanes 16a and louvred openings, having fixing holes 18 for fixing screws and an inwardly directed flange 20 around its perimeter. A mounting means 22 comprising three first framework members 24,26,28 forming the sides of a rectangle is permanently fixed to the rear face of the grille, conveniently by spot welding. The three first members 24,26,28 of the framework have flanges 30,32 along each of their edges, the first flanges 30 being fixed to the rear face of the grill such that the web 31 of each member lies perpendicular to said rear face. The second flange 32 of each member is inwardly directed such that it defines, with the rear face of the grille, a channel for reception of, in the direction of arrow II, the intumescent member 34 which is a rectangle having dimensions which are slightly less than the internal dimensions of the rectangle but greater than the internal dimensions formed by the inner edges of the second flanges 32.

The intumescent member 34 conveniently has a wire mesh 36 (only part of which is illustrated) arranged over its entire, in use, inner face and,

optionally a second wire mesh can be arranged over its, in use, outer face. The meshes 36 may be tied together with tie wires (not shown) extending through the intumescent member 34. The assembly comprising the intumescent member 34 and mesh(es) 36 is slid into its operational position behind and against the rear face of the grille through the open side of the rectangle which is then closed off using a second framework member 40 which has in a similar configuration to the first frame members 24,26,28 and has flanges 42 at its ends which, on fitting, overlap the parallel first members 24,28 and can be fixed thereto, for example by drilling and pop-riveting.

The ventilator can be fitted to a preformed hole, the dimensions of which correspond to the outer dimensions of the mounting means so that the intumescent member 34 effectively fills the hole.

It will be appreciated that the member 34 is mounted in the hole by the grille 14 which surrounds the hole and can be fixed to the structure by fixing screws passing through the holes 18. Thus an intumescent ventilator is fitted to a hole without the need to provide additional framework within the door or wall cavity, and from one side of the hole with minimum inconvenience. A standard grille can be fitted to the door or wall at the other end of the passage therethrough or, if a firebreak is required at that end, a similar intumescent ventilator may be fitted.

Fig. 4 shows a modified intumescent member 44 which comprises a plurality of parallel, mutually spaced strips 46 of intumescent material. The spacing between the strips 46 is chosen such that when they are heated by a fire and expand they contact each other to close the spacing therebetween and form an impenetratable fire barrier.

Figs. 4 and 5 show an intumescent member 44 of this type in place in a framework 48 which is capable of and suitable for supporting the intumescent member illustrated in Figs. 1 to 3. In this embodiment, rather than fitting the intumescent member from the side of the grille 14 (which is of similar

construction to the grille illustrated in Figs. 2 and 3), the intumescent member is fitted from behind the grille. This means that in the assembly stage the intumescent member can be fitted downwardly onto a grill lying face down on a work surface. This makes for easier assembly.

The modified framework 48 comprises a rectangle of first members 50 of L-shaped cross-section fixed, for example by spot welding, to the rear face of the grille. It will be appreciated that this effectively forms an open topped container into which the intumescent member can be covered.

The container is closed by fitting in the direction of arrow IV a rectangular assembly of second frame members 52, again of L-shaped cross-section surrounding or abutting in edge-to-edge relationship with the first members 50 of the framework. Connection means, for example apertured lugs 54 are provided between the first and second members which are held together by pop-rivets 56 or any other suitable fastening assembly.

Various other modifications can be made without departing from the scope of the invention, for example the grille can have alternative external configuration and structural features. The framework can have modified cross-section. The intumescent member may be varied according to the material employed. The mesh 36 may be omitted.

CLAIMS

1. An intumescent ventilator including a grille adapted for mounting on an outer face of the structure in which the ventilator is to be mounted, the grille carrying on its face facing the structure mounting means for an intumescent member which normally allows the passage of air therethrough.
2. An intumescent ventilator as claimed in claim 1, in which the intumescent member comprises a honeycomb of an intumescent material.
3. An intumescent ventilator as claimed in claim 1, in which the intumescent structure comprises a plurality of strips of intumescent material arranged in spaced relationship, the spacing being such that on being heated in a fire, the strips expand to close the spacing therebetween.
4. An intumescent ventilator as claimed in any of claims 1 to 3, in which the mounting means on its side remote from the grille is provided with a metal mesh.
5. An intumescent ventilator as claimed in any of the preceding claims, in which the intumescent member is rectangular.
6. An intumescent ventilator as claimed in any of the preceding claims in which the intumescent member has a thickness of around 20mm.
7. An intumescent ventilator as claimed in any of claims 1 to 5, in which the intumescent member has a thickness of around 40mm.
8. An intumescent ventilator as claimed in any of the preceding claims, in which the mounting means includes three first members fixed to the, in use, inner face of the grille, each member being provided at its outer edge with a flange directed towards a facing member such that the flanges and rear face of the grille defines a channel for reception of the intumescent member, and a

fourth member for closing off the open side of the rectangle formed by the first members after the intumescent member has been slid into the rectangular space.

9. An intumescent ventilator as claimed in any of claims 1 to 7, in which the mounting means includes two pairs of first members each having an L-shaped cross section and each being fixed to the inner face of the grille to define a rectangular space which accommodates the intumescent member and two pairs of second members each of the L-shaped cross section and fixed together to form a rectangle, the second and/or first members having co-operating fixing means such that the second members can be fixed to the first members to enclose the intumescent member at its edges.

10. An intumescent ventilator substantially as hereinbefore described with reference to Figs. 1 to 3 or Figs. 4 and 5 of the accompanying drawings.

11. Any novel subject matter or combination including novel subject matter disclosed herein, whether or not within the scope of or relating to the same invention as any of the preceding claims.



Application No: GB 9903967.9
Claims searched: All

Examiner: Michael R. Wendt
Date of search: 26 April 1999

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK CI (Ed.Q): A5A (A22, A23)
Int CI (Ed.6): A62C 2/06, 2/12, 2/14, 2/18; E04B 1/94; E06B 5/16; F24F 13/18
Other: Online: EPODOC, JAPIO, WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2312842 A (E.- SEALS) (& WO 97/43011 A1) e.g. see Figures 1 & 2. Page 4 line 5 - page 5 line 17.	1 & 3 at least.
A	GB 2272836 A (E. - SEALS) e.g see Figure 2. Page 6 paragraph 2. Abstract.	
X	GB 2159051 A (DIXON) e.g. see Figures 2, 5 & 6. Claim1 . Page 1 lines 117 etc. Page 2 lines 26 etc.	1 & 3.
X	GB 2107182 A (DIXON) e.g. see Figures 1, 2, 5 & 6. Claims 1 & 7. Page 1 lines 22 etc. Page 2 lines 33 etc.	---

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.